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## Transition metal oxide based heterogeneous catalyst for green biodiesel production

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A pplication of various metal oxide based catalysts for green biofuel production will be discussed in this paper. Two different approaches have been explored to yield new biodiesel catalysts. The first approach is the preparation of sulfated zirconia as acidic catalyst for biodiesel synthesis. In light of the weak association of the sulfation using sulfuric acid, chlorosulfonic acid was chosen to react with zirconium hydroxide precursor to enhance the overall stability. Catalytic studies confirm the presence of abundant medium and strong acidic sites to achieve high catalytic activity for simultaneous esterification and transesterification which shows high adaptability to crude plant oil with high acidity. The second approach is using bimetallic alkaline earth metal oxide as basic catalyst to enhance its reactivity and lifetime towards the crude oil feedstock. A series of mixed metal Ca and Mg with Fe, Mn, Cr and Ti were prepared and their catalysis was studied towards the crude plant oil for biodiesel production. It was proved that the bimetallic design can enhance their tolerance towards free fatty acid and helps to reduce the leaching of Ca or Mg ions. Other mechanistic investigation of transition metal oxide as biofuel catalyst will also be discussed.

## **Biography**

Ka Fu Yung has obtained his PhD from The Hong Kong University and is currently an Associate Professor and Associate Head of the Department of Applied Biology and Chemical Technology at The Hong Kong Polytechnic University. He won few awards including Early Career Awards from HK UGC and Gold Medals from Inventions Geneva for his findings in renewable energy related catalysis. His current research interest is mainly focused on the design of metal based material with precise surface control and high up-scalability for biofuel and fuel cell application.

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